Technical Data

Model Numbers:
AZ45E07, AZ45E09, AZ45E12, AZ45E15, AZ65H07, AZ65H09, AZ65H12, and AZ65H15

⚠WARNING **Electric Shock Hazard**

Death or serious injury can result from failure to follow these instructions.
- Service by qualified service technician only.
- Disconnect power before servicing this product.
- Reconnect all grounding devices after service.
- Replace all parts and panels before operating.

DISCONNECT POWER BEFORE SERVICING
IMPORTANT-RECONNECT ALL GROUNDING DEVICES
All parts of this appliance capable of conducting electrical current are grounded. If grounding wires, screws, straps, clips, nuts or washers used to complete a path to ground are removed for service, they must be returned to their original position and properly fastened.

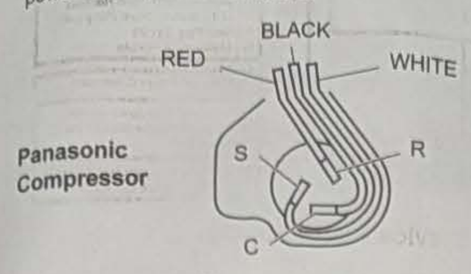
WARNING - DISCONNECT UNIT FROM ELECTRICAL POWER SUPPLY BEFORE MAKING ANY ELECTRICAL CHECKS.
MAXIMUM CURRENT LEAKAGE: 0.75 MILLIAMP
MAXIMUM GROUND PATH RESISTANCE: 0.1 OHM

IMPORTANT SAFETY NOTICE
This information is intended for use by individuals possessing adequate backgrounds of electrical, electronic and mechanical experience. Any attempt to repair a major appliance may result in personal injury and property damage. The manufacturer or seller cannot be responsible for the interpretation of this information, nor can it assume any liability in connection with its use.

WIRING - COMPRESSION DIRECT CHECK

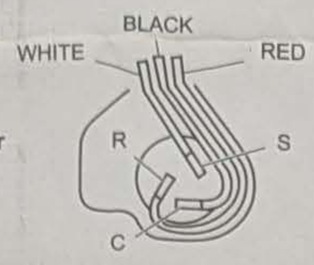
⚠CAUTION

Risk of injury. Keep head clear of terminal area when cover is removed.
- Check winding first. If open or grounded, **DO NOT** apply power to compressor terminals.



Panasonic Compressor

Compressor Wiring



RECHI Compressor

Compressor Wiring

RAK315P/320P/330P

RAK315D/320P/330D

RAK515D/520D/530D

Power Supply Kit - Appearance may vary

POWER SUPPLY AND TEMPERATURE CHECK - ELECTRIC HEAT AC UNITS (AZ45)

MODEL	RATED VOLTAGE	VOLTAGE LIMITS	EVAPORATEOR AIR TEMP IN F°	EVAP AIR OUT F° MIN	EVAP AIR OUT F° MAX	AIR TEMP CONDENSER IN F°	COOLING CURRENT MIN	COOLING CURRENT MAX
AZ45E07	208V	187-253	67	46	54	67	1.7	2.4
			80	58	66	95	2.2	3.0
			80	61	69	115	2.6	3.4
	230V		67	46	54	67	1.6	2.4
			80	58	66	95	2.1	2.8
			80	61	69	115	2.4	3.3
	265V	238-292	67	46	54	67	1.2	2.0
			80	58	66	95	1.7	2.5
			80	61	69	115	2.1	3.0
AZ45E09	208V	187-253	67	42	50	67	2.6	3.2
			80	55	63	95	3.5	4.1
			80	58	66	115	4.4	5.0
	230V		67	44	52	67	2.5	3.1
			80	55	63	95	3.2	3.8
			80	57	65	115	4.0	4.6
	265V	238-292	67	42	50	67	2.3	3.1
			80	55	63	95	2.9	3.7
			80	59	67	115	3.4	4.2
AZ45E12	208V	187-253	67	39	47	67	3.4	4.0
			80	54	62	95	4.7	5.3
			80	57	65	115	5.6	6.2
	230V		67	39	47	67	3.2	3.8
			80	53	61	95	4.1	4.7
			80	57	65	115	5.1	5.7
	265V	238-292	67	42	50	67	2.8	3.6
			80	54	62	95	3.5	4.3
			80	58	66	115	4.2	5.0
AZ45E15	230V	187-253	67	36	44	67	4.7	5.3
			80	50	58	95	5.7	6.3
			80	55	63	115	7.7	8.3
	230V		67	36	44	67	4.4	5.0
			80	51	59	95	5.7	6.3
			80	54	62	115	7.2	7.8
	265V	238-292	67	37	45	67	3.6	4.4
			80	52	60	95	4.9	5.8
			80	58	66	115	5.9	6.7

Indoor Thermistor Resistance (ohms)

°F	Air	Coil	Outlet
10	63260Ω	28030Ω	296800Ω
30	34620Ω	15340Ω	169800Ω
32	32860Ω	14570Ω	161500Ω
50	19970Ω	8850Ω	99180Ω
70	11950Ω	5300Ω	59700Ω
90	7320Ω	3280Ω	36990Ω

Outdoor Thermistor Resistance (ohms)

°F	Air	Coil
10	28030Ω	28030Ω
30	15340Ω	15340Ω
32	14570Ω	14570Ω
50	8850Ω	8850Ω
70	5300Ω	5300Ω
90	3280Ω	3280Ω

Transformer Winding Resistance:

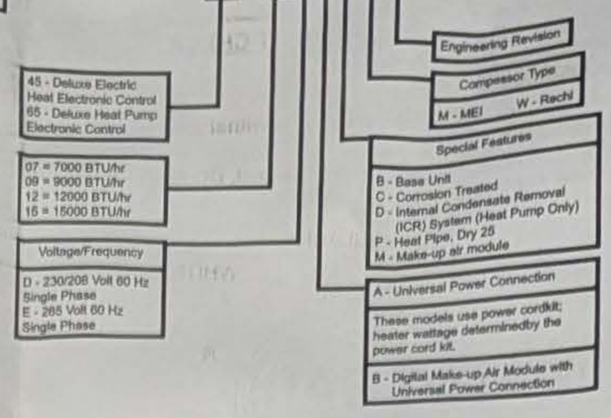
	DCR (@25°C)	
PRI	W-R	W-C
	208-230VAC 125Ω ± 15%	265VAC 154Ω ± 15%
SEC	B-B	Y-Y
	Normal: 0.71 0.85Ω Max	Normal: 3.2 3.85Ω Max

Motor Winding Resistance		
MODEL NAME	WINDING RESISTANCE (ohm)	
	INDOOR MOTOR R-B	OUTDOOR MOTOR R-B
All Models	33.3M ± 15%	9.2M ± 15%

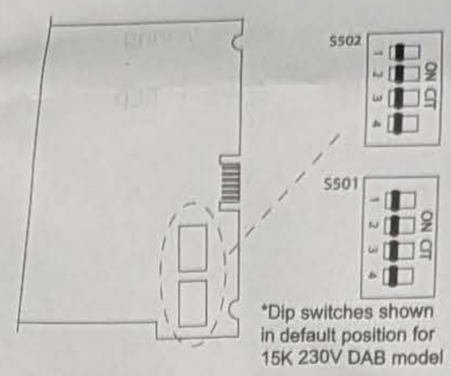
Heater Resistance: Measures between DLB Relay3 and heater connector pin indicated below. If all heaters measure open, check thermal cut-out.

Heater Coil	Heater Connection Pin	Wire Color	Cold Resistance (ohms) 208/230 Volt	Cold Resistance (ohms) 265 Volt	Active Heaters 15A Cord	20A Cord	30A Cord (low fan)	30A Cord (high fan)	Boost Heat (all cords)
1.0 kW	J310	Yellow	49.4 ±5%Ω	65.6 ±5%Ω		X		X	X
1.4 kW	J308	Brown	35.3 ±5%Ω	46.8 ±5%Ω			X	X	
2.4 kW	J307	Navy	20.2 ±5%Ω	26.9 ±5%Ω	X	X	X	X	

Nomenclature Example
AZ45E09DABW1



Service Board Set-Up

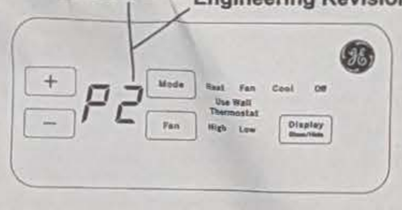


*Dip switches shown in default position for 15K 230V DAB model

Switch Position	Meaning	Switch Setting	Meaning
S502-1	Heat pipe option fitted	S501-2 = off	15k BTU
S502-2	ON = 265V model only Outlet Air Thermistor equipped - locate on the louver assembly	S501-3 = off	
		S501-2 = on	12k BTU
		S501-3 = off	
S502-3	Not used	S501-2 = off	9k BTU
S502-4	Not used	S501-3 = on	
S501-1	OFF=heat pump ON=air conditioner	S501-2 = on	7k BTU
		S501-3 = on	
S501-2	BTU Settings		
S501-3	BTU Settings		
S501-4	Make-up air module fitted		

The first time the unit is powered after a service board is installed, the UI will read "P1". Press the "+" sign until the number matches engineering revision as shown below. The engineering revision is the last number in the model number.

Nomenclature Example
AZ45E09DABW2



POWER SUPPLY AND TEMPERATURE CHECK - HEAT PUMP UNITS (AZ65)

MODEL	RATED VOLTAGE	VOLTAGE LIMITS	COOLING AIR TEMP INDOOR (°F)	COOLING AIR TEMP OUTDOOR (°F)	COOLING EVAP AIR OUT (°F) MIN	COOLING EVAP AIR OUT (°F) MAX	COOLING CURRENT MIN	COOLING CURRENT MAX	REVERSE CYCLE HEATING AIR TEMP INDOOR (°F)	REVERSE CYCLE HEATING AIR TEMP OUTDOOR (°F)	REVERSE CYCLE HEATING INDOOR COIL AIR TEMP OUT (°F) MIN	REVERSE CYCLE HEATING INDOOR COIL AIR TEMP OUT (°F) MAX	REVERSE CYCLE HEATING CURRENT MIN	REVERSE CYCLE HEATING CURRENT MAX
AZ65H07	208V	187-253	67	67	48	56	1.8	2.4	70	47	77	85	1.9	2.5
			80	95	61	69	2.4	3.0	-	-	-	-	-	-
			80	115	64	72	2.8	3.4	80	75	91	99	2.2	2.8
	230V		67	67	48	56	1.6	2.2	70	47	77	85	1.8	2.4
			80	95	61	69	2.2	2.8	-	-	-	-	-	-
			80	115	63	71	2.6	3.2	80	75	91	99	2.0	2.6
	265V	238-292	67	67	48	56	1.2	2.0	70	47	77	85	1.4	2.2
			80	95	59	67	1.8	2.6	-	-	-	-	-	-
			80	115	63	71	2.1	2.9	80	75	91	99	1.6	2.4
AZ65H09	208V	187-253	67	67	41	49	2.6	3.2	70	47	83	91	2.8	3.4
			80	95	54	62	3.4	4.2	-	-	-	-	-	-
			80	115	58	66	4.4	5.0	80	75	98	104	3.7	4.3
	230V		67	67	42	50	2.5	3.1	70	47	83	91	2.6	3.2
			80	95	54	62	3.2	3.8	-	-	-	-	-	-
			80	115	58	66	4.2	4.8	80	75	98	104	3.5	4.1
	265V	238-292	67	67	44	52	2.0	2.8	70	47	83	91	2.3	3.1
			80	95	56	64	2.8	3.6	-	-	-	-	-	-
			80	115	60	68	3.3	4.1	80	75	98	104	2.9	3.7
AZ65H12	208V	187-253	67	67	40	48	3.4	4.0	70	47	88	96	3.7	4.3
			80	95	54	62	4.5	5.1	-	-	-	-	-	-
			80	115	56	64	5.5	6.1	80	75	105	113	4.7	5.3
	230V		67	67	41	49	3.2	3.8	70	47	87	95	3.4	4.0
			80	95	55	63	4.2	4.8	-	-	-	-	-	-
			80	115	56	64	5.0	5.6	80	75	104	112	4.4	5.0
	265V	238-292	67	67	42	50	2.8	3.6	70	47	82	90	3.2	3.8
			80	95	54	62	3.6	4.4	-	-	-	-	-	-
			80	115	57	65	4.4	5.1	80	75	97	105	3.8	4.4
AZ65H15	208V	187-253	67	67	36	44	4.4	5.0	70	47	90	98	5.2	5.8
			80	95	51	59	6.2	6.8	-	-	-	-	-	-
			80	115	54	62	7.7	8.3	80	75	106	114	6.6	7.2
	230V		67	67	36	44	4.3	4.9	70	47	90	98	4.9	5.5
			80	95	51	59	5.7	6.3	-	-	-	-	-	-
			80	115	54	62	7.0	7.6	80	75	106	114	6.1	6.7
	265V	238-292	67	67	36	44	3.8	4.6	70	47	84	92	4.2	5.0
			80	95	51	59	4.8	5.6	-	-	-	-	-	-
			80	115	54	62	5.8	6.5	80	75	102	110	5.1	5.9

TEMPERATURE DIFFERENTIAL - COOLING
– Unit must operate for one hour with thermostat at coldest setting prior to measuring air temperatures. See Power Supply and Temperature Check table for normal limits.

TEMPERATURE DIFFERENTIAL - HEATING
– Unit must operate for one hour in reverse cycle heating prior to measuring air temperatures. See Power Supply and Temperature Check table for normal limits.

RUNNING CURRENT - COOLING
– With unit in case and room front installed, operated from 10 minutes on Hi-Cool. See Power Supply and Temperature Check table for normal limits.

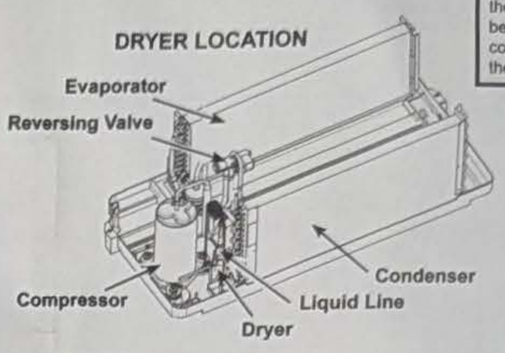
RUNNING CURRENT - HEATING
– With unit in case and room front installed, operated from 10 minutes on Hi-Heat. See Power Supply and Temperature Check table for normal limits.

RUNNING CURRENT
– With unit in case and room front installed, operated from 10 minutes on Hi-Cool. See Power Supply and Temperature Check table for normal limits.

RUN CAPACITOR CHECK
1. Replace unit run capacitor with a known good test capacitor which may be 10 MFD higher than specified and attempt to start compressor.
2. If compressor starts, install a new run capacitor which has a rating specified for the unit.

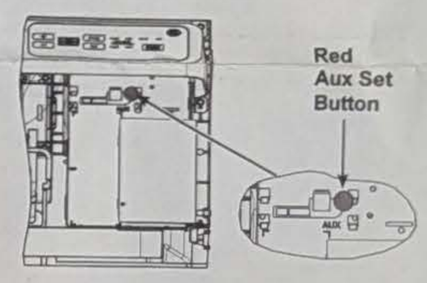
FILTER DRYER LOCATION – Install a dryer in the liquid tube between the condenser and the capillaries.

DRYER LOCATION



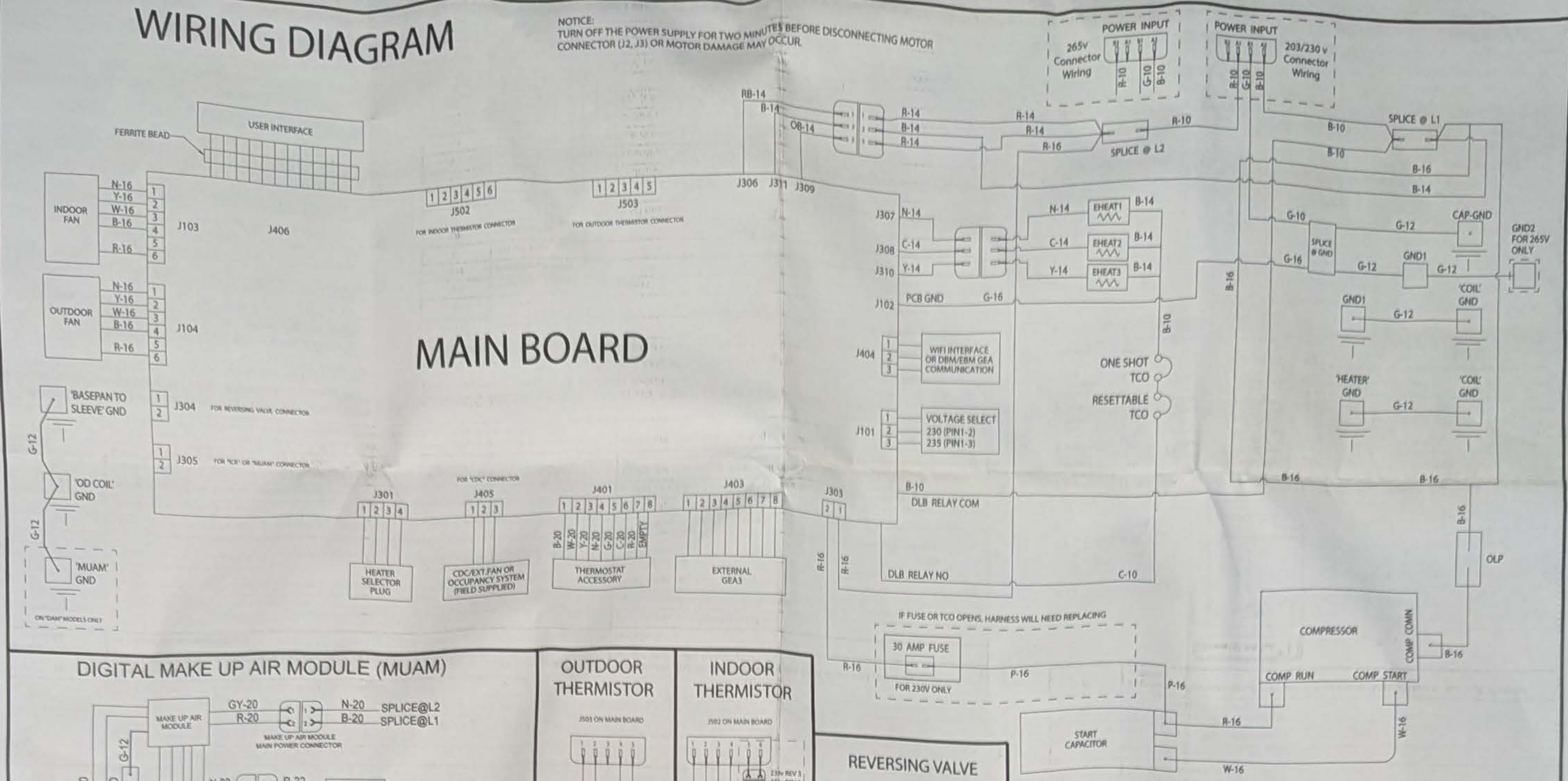
NOTICE:
A new filter dryer is required anytime the sealed system is serviced. All existing filter dryers should be removed. The new filter dryer should be used within one hour of opening.

Press the **Aux Set** Button to Exit.

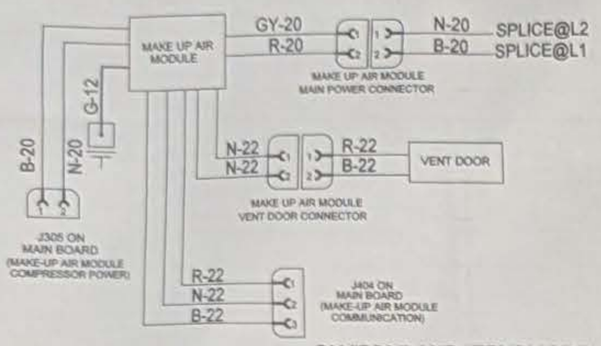


WIRING DIAGRAM

NOTICE:
TURN OFF THE POWER SUPPLY FOR TWO MINUTES BEFORE DISCONNECTING MOTOR CONNECTOR (J2, J3) OR MOTOR DAMAGE MAY OCCUR.

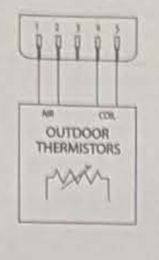


DIGITAL MAKE UP AIR MODULE (MUAM)



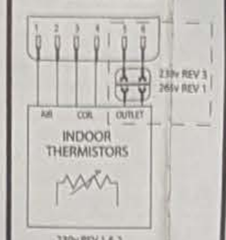
ON "DBM" AND "EBM" MODELS

OUTDOOR THERMISTOR

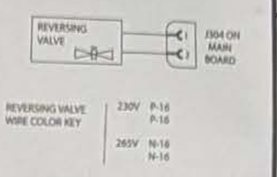


ON "AZ65H" MODELS

INDOOR THERMISTOR



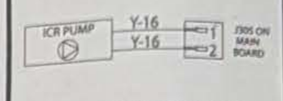
REVERSING VALVE



ON "AZ65H" MODELS

ICR PUMP

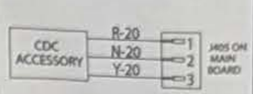
"INTERNAL CONDENSATE REMOVAL"



ON "EAD & DAD" MODELS

CDC KIT

"CENTRAL DESK CONTROL"



WIRE COLOR KEY

XX-YY XX: WIRE COLOR YY: WIRE GAUGE

B: BLACK	O: ORANGE
N: BLUE	R: RED
C: BROWN	W: WHITE
G: GREEN	Y: YELLOW
GY: GRAY	P: PINK
	DR: DARK RED

FAULT CODES - Press and hold FAN, then press AUX

This shows all current fault codes, and cycles through them. If there are no current faults, the display shows "--". Pressing AUX clears the faults. Any other key exits and preserves the faults.

Fault Code Number	Fault Meaning	Effect on system operation while fault is active
1	Inside fan fault. Fan motor not moving at commanded speed after 90 seconds of drive. Fault clears after 10 minutes.	No resistance heating, fan, heating pump or cooling available.
2	Outside fan fault. Fan motor not moving at command speed after 90 seconds of drive. Fault clears after 10 minutes.	No heat pump or cooling available. Resistance heating and fan only.
3	External thermostat wiring. Applied signal is not valid and has been constant for 30 seconds.	No external control of fans, heat and cooling internal control operation only.
4	Inside thermistor fault. One of the inside thermistors is not reading valid temperatures.	No cooling or heat pump operation available. Resistance heating and fan only.
5	Outside thermistor fault. One of the outside thermistors is not reading valid temperatures.	No cooling or heat pump operation available. Resistance heating, and fan only.
6	Compressor fault. No temperature change has been detected after 1 minute of running.	No effect.
7	Reverse valve fault. Temperature change not happening as expected after 1 minute of running.	No cooling or heat pump operation available. Resistance heating, and fan only.
8	Software fault. Stack overflow.	No effect.
9	Indoor coil freeze fault. The temperature of the inside coil has fallen below the freeze threshold (34°F).	The compressor is shut down until the coil temperature recovers.
10	Heat pump overload fault. The inside coil temperature is over the overload threshold (131°F).	The compressor is shut down while the coil temperature recovers.
11	Overheat fault. The incoming air is too hot to run the heater (95°F or more).	Heat pump and resistance heating are shut down and restarted when the temperature falls below 85°F.
12	UI board disconnected/failed.	No effect.
13	Heater airflow fault.	No resistance heating available.
16	Make-Up Air module communication fault	No communication between Zoneline and Maku-Up air module.
17	Outlet thermistor failure. Fault clears when thermistor reads value other than short circuit or open circuit.	No resistance heating available.
18	Outlet temperature overheat. The outgoing air is too hot. Fault clears when air temperature drops below threshold.	No resistance heating available.
19	Outlet temperature overheat. The outgoing air is too hot.	No resistance heating available.
23	Digital Make-Up Air module fault	Digital Make-Up Air module does not operate
24	Digital Make-Up Air module vent door fault	Digital Make-Up Air module vent door does not operate (stuck open/closed)
25	Abnormal Defrost Fault (heat pump models only). Set when 5 consecutive defrost cycles failed to warm outdoor coil above 68°F. Will self clear after 4.5 days.	Locks out heat pump, locks out defrost.
26	Air Conditioning Lockout Fault (heat pump models only). Sets when outdoor ambient temperature drops below 35°F. Will self clear after Outdoor Ambient temperature rises above 40°F.	Locks out compressor cooling operation.

When the outdoor temperature is lower than 35°F, cooling operation is locked out to prevent damage to the compressor. Operation will resume when the outdoor temperature rises above 40°F.

SERVICE MODE - Press and hold + and - , then press AUX

This menu gives various service mode operations.

On entry the display lights all LEDs. Pressing MODE steps through the entries, + turns the mode on, - turns the mode off. Stepping to the next mode turns the previous mode off.

Entry	Selection
CL	Cooling
HP	Heat pump (only on HP models)
EH	Resistance heat
IF	Indoor Fan
OF	Outdoor Fan
IC	Condenstate pump (DAD/EAD models only)
dF	Defrost (only on HP models)
S1	Indoor ambient temperature display
S2	Indoor coil temperature temperature display
S3	Outdoor ambient temperature display (only on HP models)
S4	Outdoor coil temperature display (only on HP models)
S5	Outlet air temperature display (only on 265VAC models)
UI	LED test sequence
So	Software version. Indicates V, major crit, minor crit, major non-crit, minor non-crit and cycles round
ET	Digital Make up Air Module ON (DBM/EBM models only)
dA	Door check with validation (20+ seconds to complete). DBM/EBM models only.

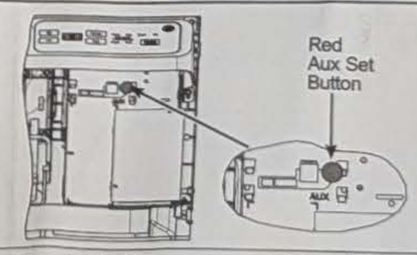
AUX key exits. If there is no activity, it exits after 15 minutes.

AUX SET - Press the red AUX set button when in STOP mode.

This menu allows you to set up various configurations - the display has a number in the left digit, and the setting in the right. The heat and cool LEDs are used as well.

On entry the display shows AU. Press MODE steps through the entries, +/- changes the value. AUX saves and exits.

Entry	Selection
1 Cool	Smart fan cooling (on/off)
1 Heat	Smart fan heating (on/off)
2	Temperature units (F or C)
3 Cool	Freeze sentinel (on/off)
3 Heat	Heat sentinel (on/off)
4	Constant fan
5 Cool	Cooling temperature limits (0 = 60-85, 1 = 64-85, 2 = 66-85, 3 = 68-85, 4 = 70-85, 5 = 72-85, 6 = 74-85, 7 = 76-85)
5 Heat	Heat temperature limits (0 = 60-65, 1 = 60-72, 2 = 60-72, 3 = 60-74, 4 = 60-76, 5 = 60-78, 6 = 60-80, 7 = 60-85)
6	External thermostat [on (Cool/Heat)/on (Auto Changeover)/off]
7	Duct mode (on/off)
8	Electric heat only (on/off)
9	Boost heat (on/off)
0	Digital Make Up Air (0-Off, Speed: 1 (Low) - 6 (High))
E	Digital Make Up Air Occupancy Enabled/Disabled (Occupancy system connection required, disables CDC functionality)
P	Engineering Revision Setup – for service use only (Match value to last digit of model number)



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